



Phase II & III Transition Milestones & Cost

MAJOR MILESTONE	FY18				FY19				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
System Architecture	█								
Prototype Development		█							
System Integration and Test			█						
Demonstrations				█					
Program Kickoff Meeting	▲								
Deliver Final Report								▲	
Army SBIR Funding		628k				368k			
Non-SBIR Funds (planned)						250k			

Purpose:

The Man-Portable Doppler Weather Radar (MPDR) Phase II project serves to develop a software-defined, small size, weight and power (SWaP) radar for quick deployment as a short-range weather and/or surveillance radar/electronic warfare system. The base MPDR can detect weather out to 50 km (severe conditions) and be transported by one soldier (<20 kilogram mass and 30 liter volume) but can be scaled to larger apertures for increased performance.

Product(s):

- The Phase II effort will develop a prototype MPDR system for evaluation and demonstration by potential end-users. The current status is TRL 6. Continued development funding is needed to finalize system packaging and continue operational mode software development (for uses such as SOCOM, AF Weather, etc.)
- The modular software-define radar transceiver, control, and processing provides products and subsystems that can be integrated in other radars and sensors such as LIDAR systems and EW receivers. BCI and its partners are currently developing ancillary sensor systems incorporating these components.

Payoff:

- The MPDR provides the Army and other end-users with a lightweight, reconfigurable radar sensors that can be deployed and operated by one or two soldiers with little operator interaction.
- The MPDR provides the user with short-range severe weather detection and identification for landing zone protection, short range perimeter surveillance, EW detection, etc.

Transitions:

- The commercial radar industry, such as BCI's commercialization partners, are already integrating the MPDR into their commercial product portfolios. US agencies such as SOCOM, the FAA and NOAA have already expressed interest in technology transfers.
- BCI is working with commercialization partners to market the MPDR technology, such as the software-defined radar processor, as commercial weather radar subsystems and components.

Points of Contact:

1. Tim Maese, BCI Principal Investigator, tmaese@bcisensors.com, 856-316-4105
2. David Ligon, Army Research Lab, david.a.ligon.civ@mail.mil, 301-394-1799

1. SBIR Topic A16-0028, Phase II Contract W911QX-17-C-0038
2. Period of Performance Sept 2017 to Dec 2021

Question Chart

1. What are the capabilities BCI is developing?

- The Man-Portable Doppler Radar (MPDR) will be a low-cost, small form factor radar system based on software-define waveform processing and radar control. This will provide the user with a flexible, short-range radar system (< 50 km) that can be easily reconfigured through new software loads to perform different tactical missions (weather surveillance, perimeter detection, EW reception, UAV detection, etc.). The scalable solution provides a path for developing larger, longer-range radar systems using the same basic component subsystems.
- The successful MPDR gives the Army and other end-users a lightweight sensor that provide situational awareness currently lacking by small teams in the field. The radar can also be scaled into larger systems for other commercial and military applications such as short-range air defense, air traffic control, etc.
- Software-defined (SD) subsystems can be ported to other applications or sensors as needed – for example, the SD radar processor is currently being integrated into another commercial radar system to reduce that system’s total cost while providing enhanced capabilities.

2. What are the current problems?

- Commercially-available electronically steered arrays are still fairly novel and at a higher-than-desired price point for the MPDR system.

3. How does BCI address these problems?

- BCI is currently working with several electronically steerable array manufacturers to evaluate technology in development (such as for the commercial satellite industry, 5G technology, etc.) and develop new, lower cost steerable arrays for the MPDR family of radars.

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4. What is current product status and transition path?

- Prototype radar system is operational as of May 2020 and is currently available for test and demonstrations. Fully packaging and ruggedization of the prototype is expected to be completed in a follow-on Phase III effort.
- EWR Radar Systems (Saint Louis, MO) is a technology transition partner currently integrating the software-defined radar processor into their existing product line and marketing the MPDR family of radars as a portable radar solution.

5. Identify Topic Sponsor and Endorsements

- Topic Sponsor: Army Research Laboratory, David Ligon, 301-394-1799, david.a.ligon.civ@mail.mil
- Transition Partner: EWR Radar Systems, Mr. Guy Blase, CEO, gblase@ewradar.com
- FAA Endorsement: Mr. Michael Emanuel, SENSR Program, Michael.emaunuel@faa.gov

6. Company Highlights

- BCI has developed and fielded weather radar processing systems for the US Navy, US Air Force and US Army for the past 15 years. Our flagship weather processor for the SPS-48 radar current is operational on over 18 US Navy carriers and amphibious assault ships.
- BCI works closely with commercialization partners such as EWR Radar Systems to develop standard commercial and novel, custom radar solutions for commercial and Government clients (US and foreign)

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